Zinātniskā asistenta amata kandidāta prezentācija

Kristians Draguns

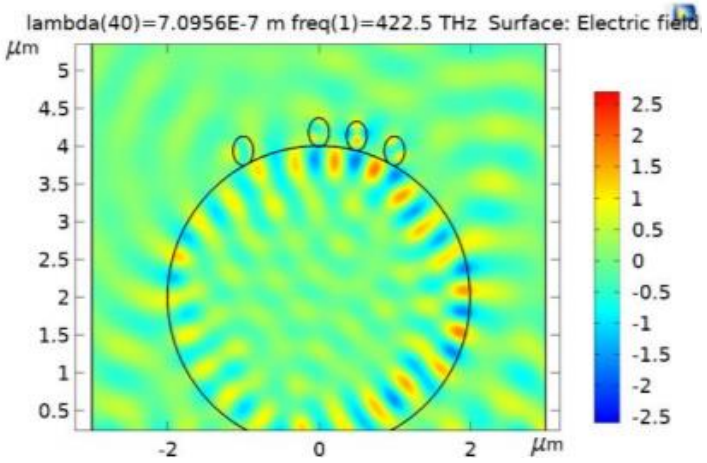
Saturs

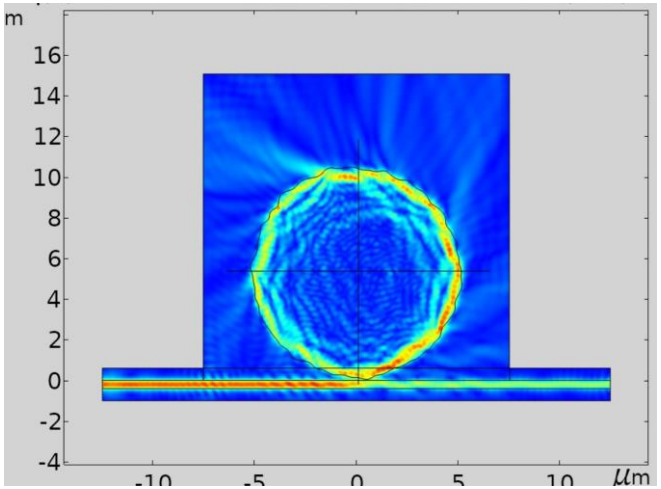
- CV
- Zinātniskā darbība
- Konferences, publikācijas
- Plāni

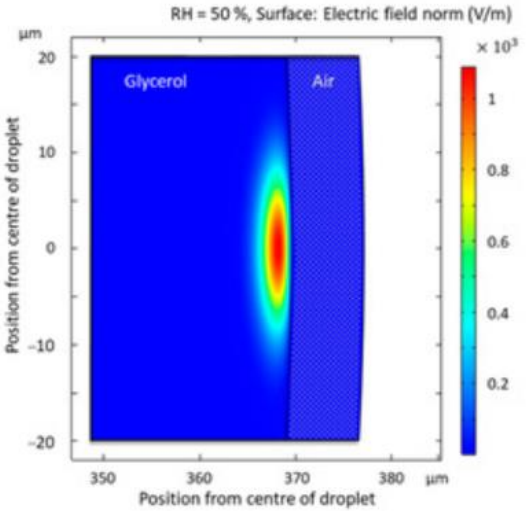
Curriculum Vitae (CV)

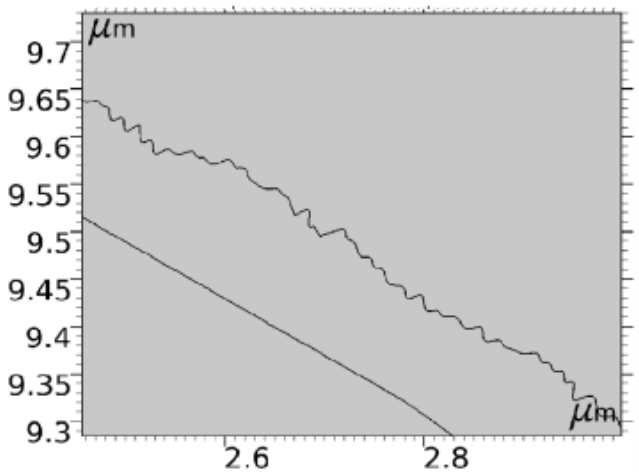
- Rīgas 64. vsk
- RTU konkurss “Pasaule pieprasa tehniskos prātus”
- Fizikas bakalaurs 2016-2019
- KAUST ziemas skola
- Fizikas maģistrs 2019-2021

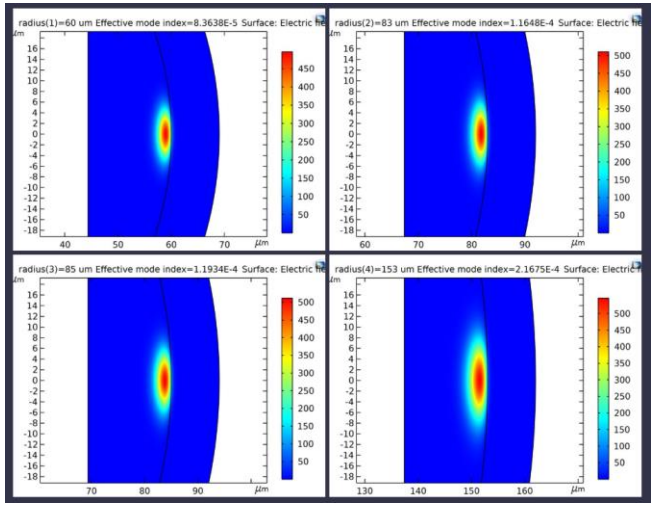
Optisko rezonatoru modelēšana









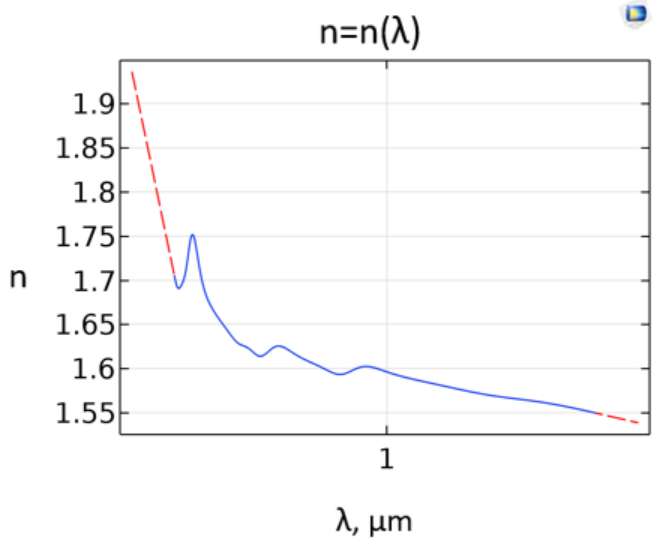


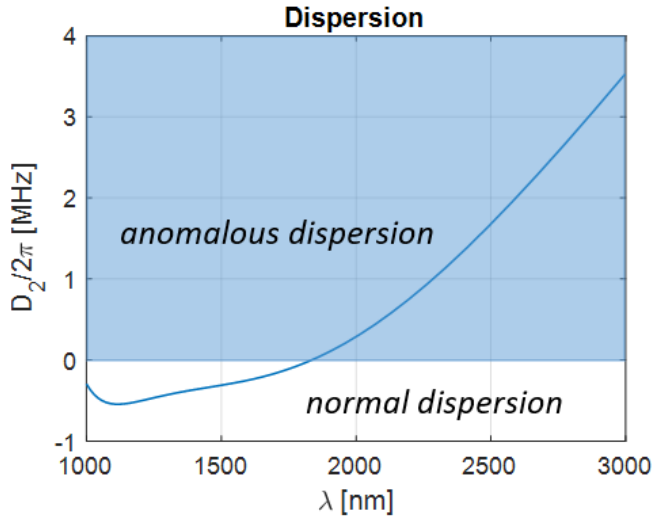
radius (um)	A_eff (um^2)
60	18.45
83	24.138
85	24.619
135	36.152

Nelineāro procesu pētīšana - dispersija

Divas pieejas – Mode Analysis un Eigenfrequency

- Aprēķina n_{eff} izmantojot Mode Analysis
- Pēc formulas $2\pi Rn = m\lambda$ aprēķina m
- MATLAB no tabulas uzdod $\omega = \omega(m)$ $[rad/s]$
- Aprēķina $FSR = \frac{\frac{\partial \omega}{\partial m}}{2\pi}$ $[Hz]$
- Dispersija $D_2 = \frac{\partial^2 \omega}{\partial m^2}$ $[rad/s]$





Eigenfrequency pieeja $n_{i+1} = n(\lambda(m(n_i)))$

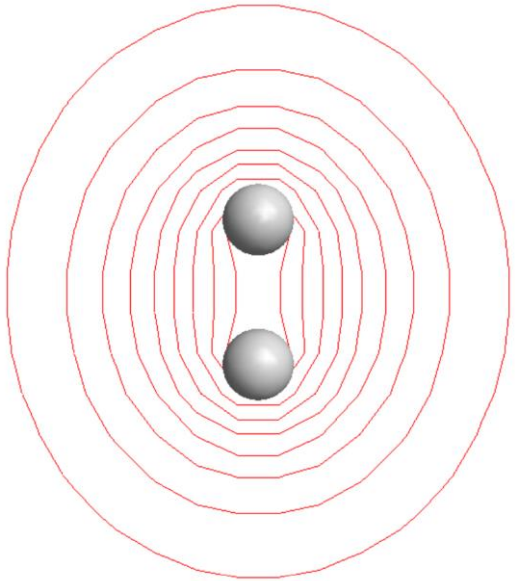
1	
m	λ (µm)
1500	2.05785
1600	1.93031
1700	1.81767
1800	1.71747
1900	1.62775
2000	1.54695
2100	1.4738
2200	1.40726
2300	1.34648
2400	1.29074
2500	1.23943
2600	1.19205
2700	1.14816
2800	1.10739
2900	1.06942
3000	1.03397

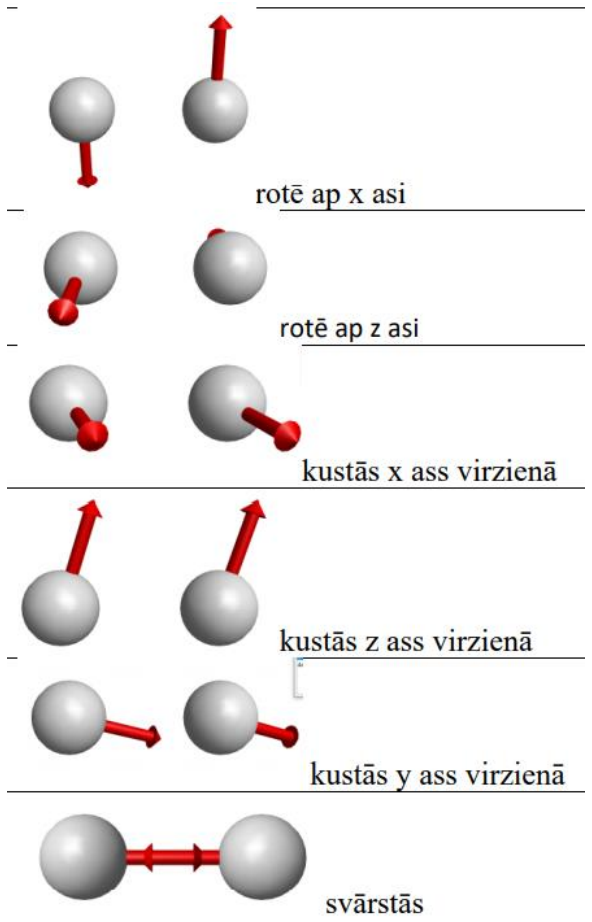
2		
m	λ (µm)	Δλ
1500	1.97181	-0.08605
1600	1.85198	-0.07833
1700	1.74579	-0.07188
1800	1.65105	-0.06642
1900	1.56602	-0.06173
2000	1.48929	-0.05765
2100	1.41972	-0.05408
2200	1.35634	-0.05092
2300	1.29838	-0.0481
2400	1.24517	-0.04556
2500	1.19616	-0.04327
2600	1.15086	-0.04119
2700	1.10887	-0.03929
2800	1.06985	-0.03755
2900	1.03348	-0.03594
3000	0.99952	-0.03445

3		
m	λ (µm)	Δλ
1500	1.97355	0.00174
1600	1.85338	0.0014
1700	1.74694	0.00115
1800	1.65201	0.00096
1900	1.56684	0.00082
2000	1.49	0.0007
2100	1.42033	0.00062
2200	1.35689	0.00055
2300	1.29887	0.00049
2400	1.24562	0.00044
2500	1.19656	0.00041
2600	1.15123	0.00037
2700	1.10922	0.00035
2800	1.07017	0.00033
2900	1.03379	0.00031
3000	0.99982	0.0003

4		
m	λ (µm)	Δλ
1500	1.97351	-3.4344E-05
1600	1.85336	-2.448E-05
1700	1.74692	-1.8033E-05
1800	1.652	-1.3681E-05
1900	1.56683	-1.0672E-05
2000	1.48999	-8.5238E-06
2100	1.42033	-6.9731E-06
2200	1.35688	-5.8278E-06
2300	1.29887	-4.9655E-06
2400	1.24561	-4.3129E-06
2500	1.19656	-3.8132E-06
2600	1.15123	-3.4271E-06
2700	1.10922	-3.1269E-06
2800	1.07017	-2.8923E-06
2900	1.03379	-2.7105E-06
3000	0.99981	-2.5692E-06

Atomfizikas aprēķini





Publikācijas

	All	Since 2016
Citations	7	7
h-index	2	2
i10-index	0	0

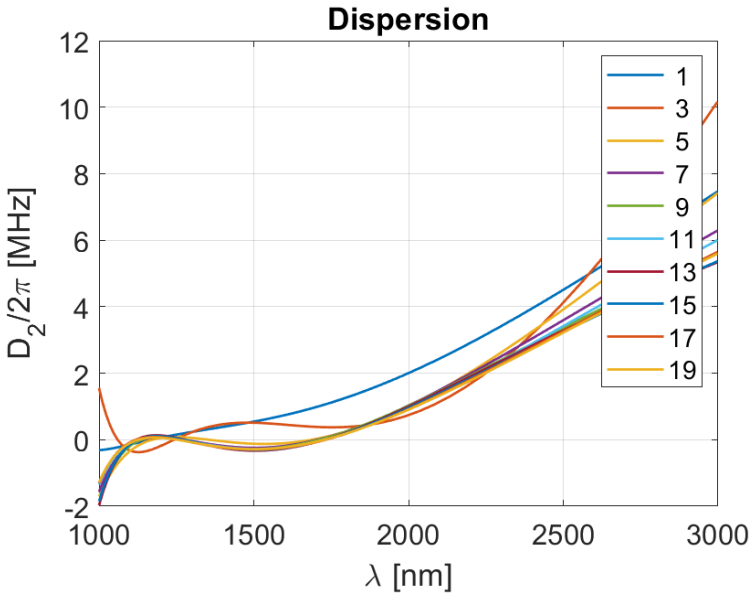
☐	Whispering gallery mode resonators covered by a ZnO nanolayer I Brice, R Viter, K Draguns, K Grundsteins, A Atvars, J Alnis, E Coy, ... Optik 219, 165296	4	2020
☐	Quality Factor Measurements for PMMA WGM Microsphere Resonators Using Fixed Wavelength Laser and Temperature Changes R Berkis, J Alnis, A Atvars, I Brice, K Draguns, K Grundsteins 2019 IEEE 9th International Conference Nanomaterials: Applications …	3	2019
☐	Computer modelling of WGM microresonators with a zinc oxide nanolayer using COMSOL multiphysics software K Draguns, I Brice, A Atvars, J Alnis Laser Resonators, Microresonators, and Beam Control XXIII 11672, 1167216		2021
☐	Mode family analysis for PMMA WGM micro resonators using spot intensity changes R Berķis, J Alnis, I Brice, A Atvars, K Draguns, K Grundšteins, PK Reinis Laser Resonators, Microresonators, and Beam Control XXIII 11672, 1167217		2021
☐	High-Sensitivity Whispering Gallery Mode Humidity Sensor Based on Glycerol Microdroplet Volumetric Expansion PK Reinis, L Milgrave, K Draguns, I Brice, J Alnis, A Atvars Sensors 21 (5), 1746		2021
☐	Optical whispering gallery mode microresonator sensors. A Atvars, I Brice, K Grundšteins, R Berķis, K Draguns, J Alnis Achievements and Future Prospects, 58		2019

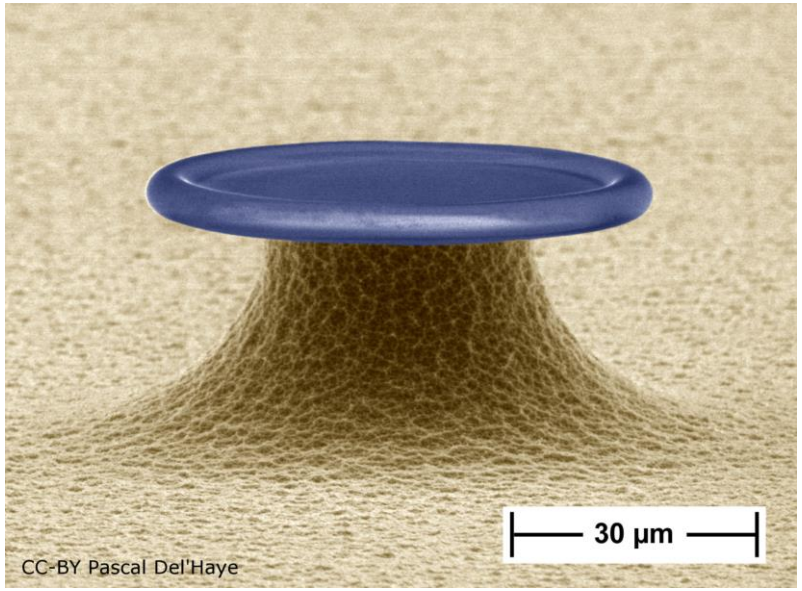
Konferences

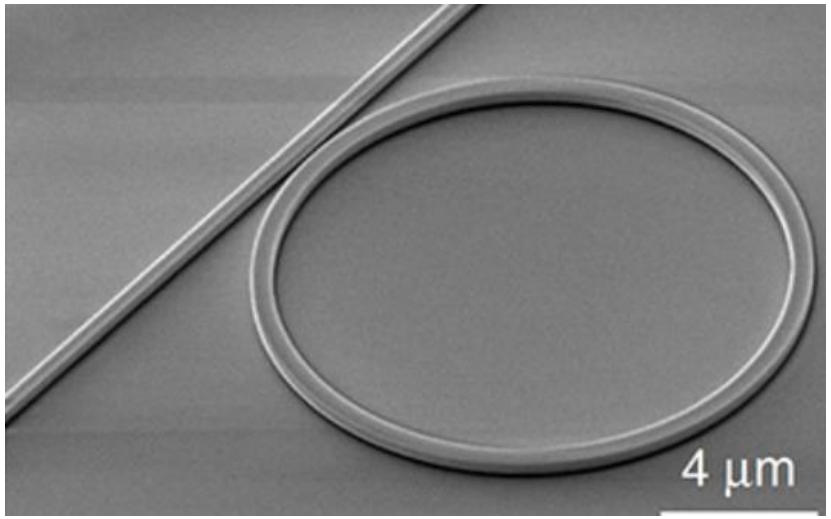
- Developments in Optics and communications 2019, Modelling of sensors based on whispering gallery mode optical microresonators
- Latvijas Universitātes 78. starptautiskā zinātniskā conference, Temperature measurments of WGM microresonators in air and water
- Photonics Online Meetup, Mode family analysis for PMMA WGM micro resonators using spot intensity changes
- Latvijas Universitātes 79. starptautiskā zinātniskā konference, ČGM mikrorezonatora uzpumpēšanas par frekvenču ķemmi modelēšana
- SPIE Photonics WEST, Computer modelling of WGM microresonators with a zinc oxide nanolayer using COMSOL multiphysics software
- Open Readings 2021, Dispersion Engineering of Whispering Gallery Mode Resonators for Frequency Comb Generation and Telecommunication Applications
- Developments in Optics and communications 2021, Dispersion engineering of whispering gallery mode resonators for Kerr frequency comb generation
- Quantum Optics and Photonics 2021, Dispersion engineering of whispering gallery mode resonators

Plāni

- CFI litogrāfija

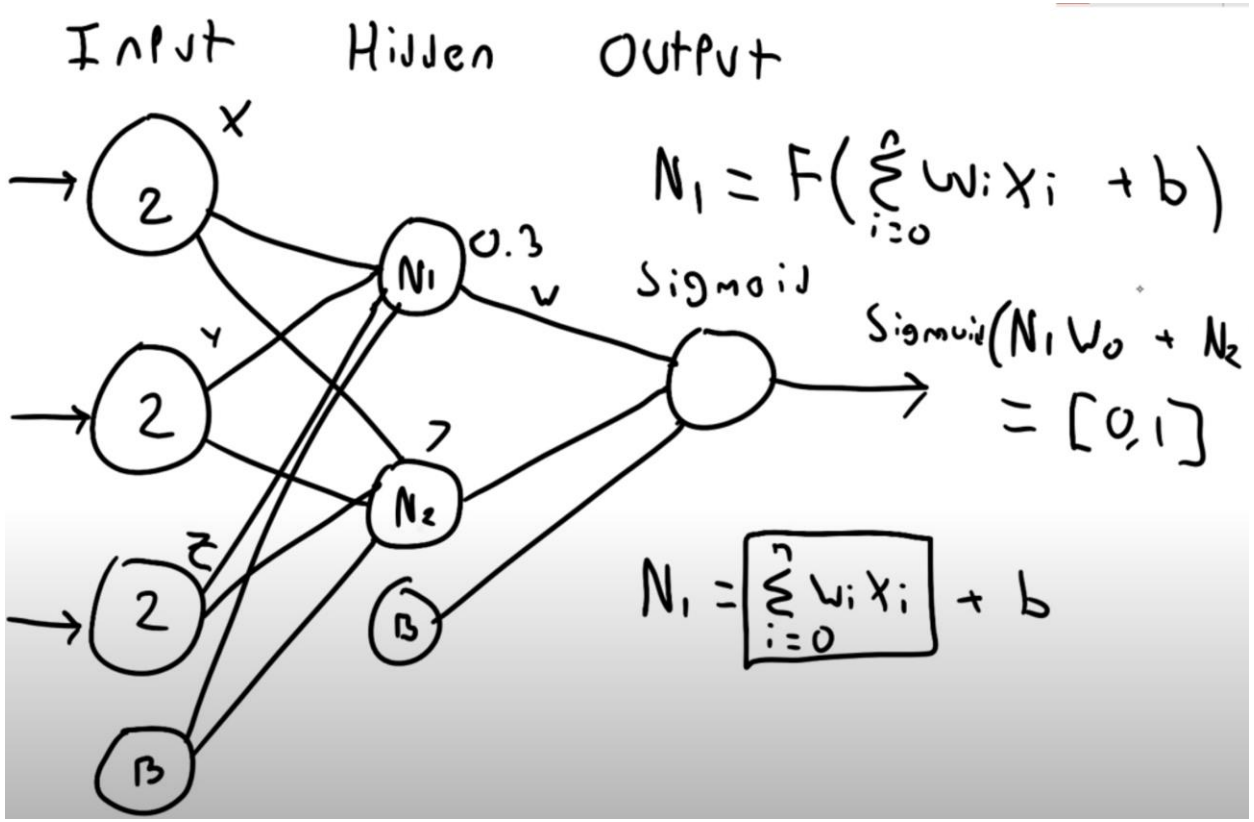


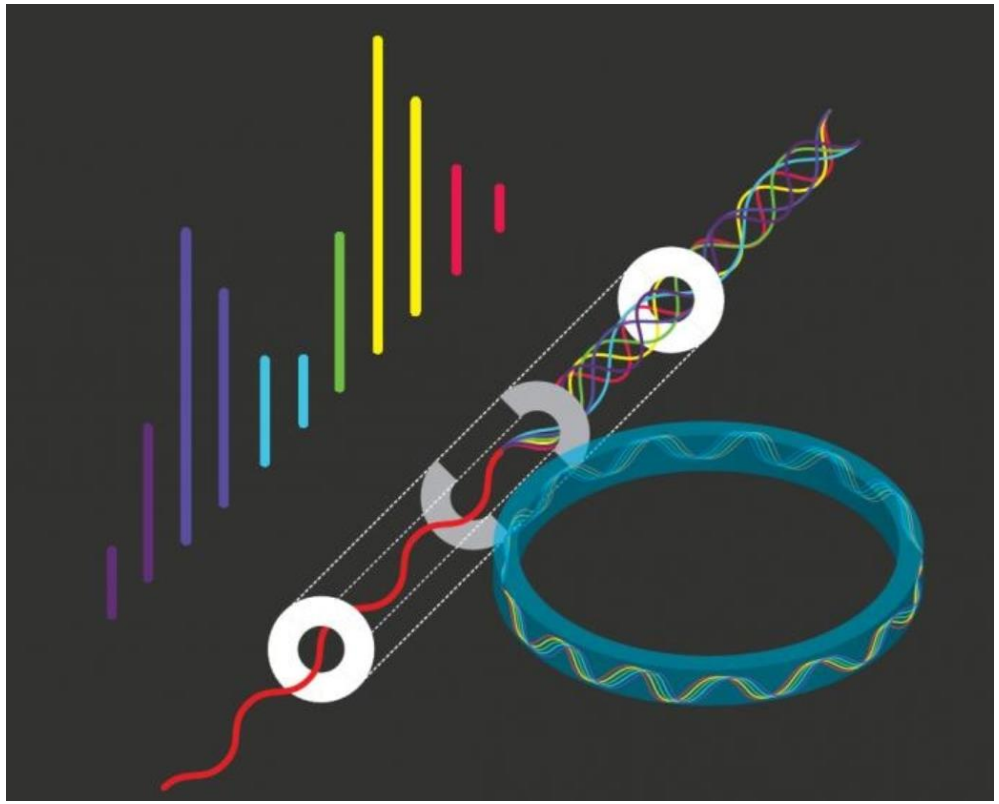




Plāni

- Neirālie tīkli, machine learning





Paldies!